IN THE CLAIMS:

1. (Currently Amended) A method of inspecting patterns, comprising the steps of:

picking up a first pattern formed on a substrate to produce a first image;

storing the first image;

picking up a second pattern that is also formed on the substrate so as to have naturally the same shape as the first pattern, thereby producing a second image;

aligning the first image and the second image with an accuracy of one pixel unit;

after the first image and the second image are aligned with an accuracy of one pixel unit, adjusting a brightness of at least one of the first image and the second image to match a brightness of the first image with a brightness of the second image for each pixel; and

comparing the first and second images aligned and matched in brightness to detect a defect of the patterns by using information of a scattered diagram of brightness of the first and second images.

2. (Previously Presented) A method according to claim 1, wherein the step of adjusting the brightness of at least one of the first image and the second image to match the brightness of the first image with the brightness of the second image is performed by means of a linear conversion having a gain and an offset so that the

brightness of the first image can be made substantially equal to the brightness of the second image.

3. (Canceled)

4. (Previously Presented) A method according to claim 1, wherein a surface of the substrate is covered with an optically transparent film; and wherein a surface of the optically transparent film is processed to be flat.

5. (Previously Presented) A method according to claim 1, wherein the step of picking up the first pattern and the step of picking up the second pattern are performed optically.

6. (Previously Presented) A method according to claim 1, wherein the step of picking up the first pattern and the step of picking up the second pattern are performed by use of an electron beam.

7. (Currently Amended) A method of inspecting a pattern, comprising the steps of:

picking up a first pattern formed on a substrate to produce a first image;

storing the first image;

picking up a second pattern that is formed on the substrate so as to have naturally the same shape as the first pattern, thereby producing a second image;

aligning the first image and the second image with an accuracy of one pixel unit;

after the first image and second image are aligned with an accuracy of one pixel unit, adjusting a brightness of at least one of the first image and the second image by collectively filtering the first image and the second image to match the brightness of the two images;

performing gradation conversion of at least one of the first image and the second image to match a brightness of the first image with a brightness of the second image for each pixel;

comparing the first and second images to detect a defect and to obtain features of the detected defect by using information of a scattered diagram of brightness of the first and second images; and

displaying information of the features of the detected defect on a screen.

8.-11. (Canceled)

12. (Previously Presented) A method according to claim 7, wherein the step of aligning the first image and the second image is performed for each of a plurality of pixels of the first image and the second image.

13. (Previously Presented) A method according to claim 7,

wherein the substrate is a semiconductor wafer;

wherein the semiconductor wafer has a surface covered with an optically transparent film; and

wherein a surface of the optically transparent film is processed to be flat.

14. (Previously Presented) A method according to claim 7, wherein the step of performing said gradation conversion of at least one of the first image and the second image is performed within each of a plurality of local areas of the at least one of the first image and the second image.

15. (Currently Amended) An apparatus for inspecting defects of patterns, comprising:

image pick-up means for picking up a first pattern formed on a substrate and a second pattern that is also formed on the substrate so as to have naturally the same shape as the first pattern, thereby producing a first image of the first pattern and a second image of the second pattern;

storage means for storing the first image;

alignment means for aligning the first image and the second image with an accuracy of one pixel unit;

brightness conversion means for adjusting a brightness of at least one of the first image and the second image by collectively filtering the first and second images to match a brightness of the two images;

gradation conversion means for performing gradation conversion of at least one of the first image and the second image to match a brightness of the first image with a brightness of the second image for each pixel;

defect detection means for comparing the first and second images, at least one of which has a brightness which has been corrected by the gradation conversion means, thereby detecting defects of the patterns by using information of a scattered diagram of brightness of the first and second images; and

output means for producing information of the defects of the patterns detected by the defect detection means.

16. (Canceled)

17. (Previously Presented) An apparatus according to claim 15, wherein the gradation conversion means corrects brightness values of the at least one of the first and second images so as to match a brightness of the first image with a brightness of the second image by performing a linear conversion having a gain and an offset.

18. (Previously Presented) An apparatus according to claim 15, wherein the image pick-up means optically picks up the first pattern and the second pattern.

19. (Previously Presented) An apparatus according to claim 15, wherein the image pick-up means picks up the first pattern and the second pattern by use of an electron beam.

20. (Previously Presented) An apparatus according to claim 15, wherein the output means displays on a screen information of a brightness, a local contrast, or a local average of the first and second images.

21. (Previously Presented) An apparatus according to claim 15, wherein the gradation conversion means corrects the brightness of the at least one of the first image and the second image after the alignment means has aligned the first image and the second image with the accuracy of one pixel unit.

22. (Currently Amended) An apparatus for inspecting defects of a plurality of patterns formed on a substrate so as to have naturally the same shape, comprising:

table means on which the substrate is placed, and which can be moved in an X-Y plane;

image pick-up means for picking up the patterns of the substrate placed on the table means to produce images of the patterns;

proposed-defects extracting means for processing the images of the patterns when the substrate placed on the table means is continuously moved, after the images of the patterns have been aligned with an accuracy of one pixel unit, and at least one of the images of the patterns has been subjected to gradation conversion to match a brightness of the at least one of the images with a brightness of at least one other one of the images for each pixel of the images, thereby extracting proposed defects of the patterns;

defect detection means for detecting true defects from the proposed defects of the patterns that have been extracted by the proposed-defects extraction means by using information of a scattered diagram of brightness of the first and second images; and

output means for producing information of the true defects detected by the defect detection means.

23. (Previously Presented) An apparatus according to claim 22, wherein the proposed-defects extraction means further estimates certainty information of the extracted proposed defects based on at least one of a brightness, a local contrast, and a local average of the images of the patterns.

24. (Previously Presented) An apparatus according to claim 22, further comprising:

storage means for storing the images of the patterns produced by the image pick-up means;

alignment means for aligning the images of the patterns stored in the storage means and the images of the patterns produced by the image pick-up means with an accuracy of one pixel unit; and

brightness filter means for adjusting a brightness of at least one of the images aligned by the alignment means by collectively filtering all images of the patterns to match a brightness of the images;

gradation correction means for correcting a brightness of at least one of the images aligned by the alignment means by performing gradation conversion of at least one of the images of the patterns to match a brightness of the images for each pixel;

wherein the proposed-defects extraction means extracts the proposed defects of the patterns from the aligned images, at least one of which has a brightness which has been corrected by the gradation conversion means, and estimates certainty information of the extracted proposed defects.

25. (Previously Presented) An apparatus according to claim 24, wherein the alignment means aligns the images of the patterns stored in the storage means and the images of the patterns produced by the image pick-up means with an accuracy of one pixel unit within each of a plurality of small divisions of the images of the patterns.

26. (Previously Presented) An apparatus according to claim 24, wherein the gradation conversion means corrects a brightness of the at least one of the images aligned by the alignment means within each of a plurality of local areas of the at least one of the images aligned by the alignment means.

27. (Currently Amended) An apparatus for inspecting defects of patterns, comprising:

image pick-up means for picking up a first pattern formed on a substrate and a second pattern that is formed on the substrate so as to have naturally the same shape as the first pattern, thereby producing a first image of the first pattern and a second image of the second pattern;

storage means for storing the first image;

defect detection means for correcting at least one of the first image and the second image by performing gradation conversion of at least one of the first image and the second image to match a brightness of the first image with a brightness of the second image for each pixel of said first and second images, aligning the first image and the second image with an accuracy of one pixel unit, collectively filtering the first image and the second image to match a brightness of the first image with a brightness of the second image, comparing the first image and the second image aligned and matched in brightness to detect defects, by using information of a scattered diagram of brightness of the first and second images, and then estimating information of the detected defects; and

display means for displaying on a screen the defects detected by the defect detection means, and the information of the detected defects.

28. (Previously Presented) An apparatus according to claim 27, wherein said defect detection means includes:

alignment means for aligning the stored first image and the second image with an accuracy of one pixel; and

gradation conversion means for performing gradation conversion to correct a brightness of at least one of the first image and the second image;

wherein the defect detection means compares the aligned first and second images, at least one of which has a brightness which has been corrected by the gradation conversion means, thereby detecting the defects.

29. (Previously Presented) An apparatus according to claim 27, wherein the image pick-up means optically picks up the first and second patterns.

30. (Previously Presented) An apparatus according to claim 27, wherein the image pick-up means picks up the first and second patterns by use of an electron beam.

31. (Previously Presented) A method according to claim 1, wherein the gradation conversion minimizes a sum of squares of differences between the brightness of the first image and the brightness of the second image within each of a plurality of local areas of the first image and the second image.

32. (Previously Presented) A method according to claim 7, wherein the gradation conversion minimizes a sum of squares of differences between a brightness of the first image and a brightness of the second image within each of a plurality of local areas of the first image and the second image.

33. (Previously Presented) A method according to claim 14, wherein the gradation conversion minimizes a sum of squares of differences between a brightness of the first image and a brightness of the second image within each of a plurality of local areas of the first image and the second image.

34. (Previously Presented) An apparatus according to claim 15, wherein the gradation conversion minimizes a sum of squares of differences between a brightness of the first image and a brightness of the second image within each of a plurality of local areas of the first image and the second image.

35. (Previously Presented) An apparatus according to claim 22, wherein the gradation conversion minimizes a sum of squares of differences between a brightness of one of the images of the patterns stored in the storage means and a brightness of one of the images of the patterns produced by the image pick-up means within each of a plurality of local areas of the one of the images of the patterns stored in the storage means and the one of the images of the patterns produced by the image pick-up means.

36. (Previously Presented) An apparatus according to claim 27, wherein the gradation conversion minimizes a sum of squares of differences between a brightness of the first image and a brightness of the second image within each of a plurality of local areas of the first image and the second image.